

The Further Education of the Graduate Physician

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WHAT DOES IT MEAN to teach medicine today? To squeeze the whole world of knowledge we possess; to extract what is fundamental, what is basic, limiting ourselves to the indispensable; to train a student in the complicated techniques of modern methods of study, educate his spirit to make a man of science out of him, wise in observation, aware in research, accurate in his reasoning—and all this without depriving him, as a clinician, of the ability to apply his knowledge. To achieve all this over a period of a few years, while the youth becomes a man, and then send him out into the world with an education and a mentality in harmony with our times—let us agree that this is a grand educational task, a fine challenge to the most optimistic teacher.

The difficulty of teaching medicine began to be faintly apparent in the Sixteenth Century, when the spirit of the Renaissance broke the bonds of dogma and scholastic prejudice and opened the path of science, of seeing, of observing in order to understand, of questioning nature directly, rather than seeking for the answer in an old book of Galen. Leonardo and Vesalius were the first to open the breach. Through this breach there passed after them the great renovators, from Harvey to Morgagni.

Thus the difficulty of teaching medicine grew slowly greater as the Nineteenth Century drew nearer, the century when scientific medicine as we understand it made its appearance, and had

us, with Laennec, practice the physical exploration of the sick; register, with Ludwig and with Bernard, their organic functions; taught us, with Pasteur and with Koch, to observe the intimacy of their immunological reactions, and to predetermine, with Virchow, the magnitude of those organic lesions caused by disease.

This whole enormous common reserve of knowledge required, in order to be taught, lengthened studies and more complicated explorations, the provision of laboratories and the management of equipment. Upon the subsequent appearance, at the beginning of the Twentieth Century, of radiology, electrocardiography, a new aseptic surgery and biochemical laboratories, there also appeared, it is true, new complications in the teaching of future physicians and surgeons, but the complications did not go beyond the insuperable. In fact one did not breathe the air of anguish in schools of medicine before the nineteen twenties.

However, from that time up until now, in the space of what is hardly two generations, the change is impressive. This is particularly true of the years between the end of the Second World War and today. The giddy career of the sciences and of different techniques, ever more precise, ever more complex and ever more indispensable, have made of medicine a world of knowledge, the domination of which is far beyond all human possibility. And day after day new material and new discoveries continue to accumulate in an inexhaustible flood upon this already gigantic mass.

It is impossible to teach all this. One can only select what is fundamental, what is demonstrably true or, at most, what is highly promising; that is,

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one can only weld together a solid and coherent structure of basic knowledge; and that is all that a school of medicine can hope to achieve. Subsequently there will be specialization to ensure total ability in a chosen field, and then subspecialization to allow the fullest possible exploration of a limited theme; and finally there will be research, the requisite for advance and for the addition of new material to our world of knowledge.

Thus medicine progresses, at a rate that can only be considered fantastic. Teaching, however, is not keeping pace with progress. It cannot do so. The anguished atmosphere we breathe derives from the very awareness of the distance, a distance that grows greater every day, between what is known and what is taught. And together with this, there is also the awareness of the difficulty, the immense difficulty, of halting this tendency. How can this distance be shortened? Here we have the problem.

There are countries, such as Mexico, where to the problem of the growth in medical knowledge we must add the problem of the impressive increase in the number of students desirous of studying the subject. Thus the difficulties of teaching grow in a geometric progression.

In one way or another, in different degrees of acuteness, the problem exists throughout the world. It is a universal phenomenon, the fruit of our times. But there is yet still more, something further to complicate the lives of our schools of medicine, something which although it did indeed exist in the past, but only today, only in our times, has come to the surface and become one of our primary preoccupations.

While medicine progressed but slowly, employing relatively simple techniques, the physician or surgeon could complete or renew his studies throughout the course of his professional life. This he did alone, depending upon his reading and the accumulation of experience.

Keeping Up-to-Date

Today such efforts must be considered rudimentary. And thus we face the problem: How may we ensure that the medical school graduate who goes out into the world with a modern equipment of knowledge shall not allow it to become rusty and out-of-date? How may we ensure that he does not become old-fashioned, becoming a public danger? What can we do to keep him up-to-date and ensure his continued education?

Such is the challenge of our times. It is a chal-

lenge that concerns those young men now leaving our hands, as well as the older physicians who have spent many long years in the profession. And we might enquire what would be the result if this latter group should be examined.

One day a French clinician asked a curious question: If a doctor, in the style of a fairy tale, had fallen asleep in 1934 and awakened today, how would he regard the panorama of modern medicine? Would he even begin to understand it?

We are all capable of elaborating upon the answer. His surprise, of course, would approach astonishment. Theories and methods of exploration, diagnoses and treatments that he had neither known nor imagined in his day, are, he would find, all taken quite as a matter of course today. He would learn of catheterization of the heart, endoscopic examination of a wide variety of organs, selective angiocardiology, biopsy of all the viscera including the heart, tests employing radioactive isotopes and the determination of enzymes and hormones of which he had known nothing; he would hear of surgical repair of the heart, using plastic materials and artificial valves, the grafting of large vessels, the use of mechanical pumps in substitution for the heart and lungs, and of filters employed as artificial kidneys, of the substitution of live organs, overcoming the problem of foreign body intolerance—he would learn of all this that in “his time” appeared to be impossible and is today put into practice daily.

He would also be confronted by the miracle of antibiotics and by the cure of both meningitis and endocarditis, previously called incurable; he would note the beginning of control of tuberculosis and leprosy, and the almost complete disappearance of certain medical specialties, now unnecessary. He would observe large populations protected against poliomyelitis, and he would see social scourges such as rheumatic fever and salmonellosis, amebiasis and *mal de pinto* greatly diminished if not completely dominated. He would observe diabetes controlled and arterial hypertension overcome. He would see infant mortality reduced to a minimum and the expectancy of life increased to a maximum, to some 72 years. And, as a kind of irony, he would discover that man is now concerned about space medicine, in expectation of the need for interplanetary travel!

Taken together, all of this constitutes a proper motive for pride for contemporary medicine, but it also establishes the degree of danger. What

would occur if this physician, after being asleep for some 30 years, wished to practice again? Consider the danger attendant upon his treating patients according to the knowledge and procedures of the past.

This then, although less spectacular, is the drama of many members of the medical profession who, over long years of practice, have never renewed their scientific equipment, and who live and think and work as they were accustomed to in "the old days." It is true that even without studying they become fragmentarily aware of certain advances. The press, the radio, the pharmaceutical salesmen who bring technical advertisements of the new drugs to their consulting rooms, the commercial house magazines that are freely offered, the whole apparatus of modern publicity oblige them to come into contact with certain novelties. But we shall agree that this flood of information comes to them along an empirical road and is received uncritically and in a disordered fashion. Without ever realizing it, what they practice is no longer scientific medicine; it is hardly even a trade.

Personal Drama and a Social Problem

It is true enough that this is a personal drama, but it is also a social problem. It concerns us all in a moment when it is a danger for many. The case I mention of the older physician who no longer studies is much more common than might appear. Ten years of neglect are enough, in the medical profession, to become out-of-date. And within these limits there are a great many who fall.

The medical profession as a whole has understood the problem in these terms, particularly since the end of the war, and has multiplied the opportunities for practicing physicians to study. Many methods have been employed—lectures, monographic courses, symposia, periodic meetings of scientific societies. There are congresses of all kinds, bulletins and reviews, special television and radio programs; all the various media of communication have been tried. Year after year, more and greater efforts are made; and to achieve success, medical schools, hospitals, scientific societies and research institutes all collaborate. In the present year alone, in these United States, some one thousand, two hundred and sixty-four courses of further education have been offered by some two hundred and sixty-seven institutions.

However, despite the enormous effort, the problem grows at the same rate as medical science ad-

vances, and there are many, very many, physicians who have not responded to the call, and who have cut themselves off from the whole scientific world.

The obstacles vary greatly according to the distinct conditions. When the physician lives in a city where there is a medical school or an important hospital, all is easy for him. But when he lives in a small town or is settled in some isolated spot; when his economic situation is such that he cannot travel in search of instruction; when he is old, or tired; above all when he no longer feels either hunger or thirst for renewal, it is then that there seems to be no simple, efficient way to undertake his further education. One such physician once said to me dispiritedly, "The train has left me behind."

If this only occurred with age, there would be at least, an excuse in the biological fact. But the gravity of the problem resides in the fact that this is not an ill peculiar to men advanced in years. For this reason it is necessary to try to apply the remedy from the beginning, before any signs of spiritual devastation are to be seen. The remedy must be applied during youth, when the mind is undergoing its intellectual formation. It is then that we must teach the young how to study, must help them develop a taste for learning. Rather than teach a certain quantity of science, we must teach them to love it. When one has this love, the rest shall be given, as the Bible has it.

The Seed of Continuing Education

Here, then, is the key to further education. It lies in preparing for it from student days onward. The student who does not content himself with the word of the teacher when learning, but who seeks out the sources for himself; the student who learns to use books and to make notes of his reading; he who becomes accustomed to summarizing them, ordering them and evaluating them whether according to his own critical judgment or according to a scheme that clarifies or unites them; the student who is not content just to know, but who learns how to increase or modify his knowledge—such a student is protected against changes in ideas and fitted to understand the advances of the morrow. Such a student runs no risk of seeing the knowledge that he was given in his medical school grow out-of-date or simply rot.

In the National Institute of Cardiology in Mexico, where we accept young physicians from all over the world to provide them with a thorough

grounding in the specialty, we see eloquent examples. Once the habit of study is created, once the habit of forming a personal judgment and of submitting it to the criticism of fellow workers is achieved, we see these young men, their stay with us completed, off to establish themselves in the provinces or abroad, frequently return to refresh their knowledge. There are some who make a short trip every Thursday to attend the general anatomoclinical sessions; there are others who come from a distance, or from other countries, every year to repeat monographic courses. Their love for science, like the Muslim's love for his religion, causes them to turn their faces periodically towards their Mecca.

Thus this has become one of the fundamental obligations of every medical school. Previously it was enough to turn out a good physician; today, confronted by the perspective of rapid change and the threat of professional deterioration, medical schools must prepare their students for the future, teaching them to renovate their knowledge.

In this way the further education of the practitioner will be greatly facilitated. There will be no reason for it to be limited to the annual addition of a few novelties. Indeed, it is not a process of accumulation but of change, of the renovation of doctrines. When something new is added, it is almost invariably necessary to get rid of something else. And this, in the field of ideas, is not easy. It requires an enormous effort to abandon those ideas which have accompanied us throughout our lives. It might even seem that some of them crystallize, become petrified, reach the point where they become an integral part of our beings. If it is difficult to learn after a certain age, to "unlearn" is even more difficult.

Wide Range of Possibilities

I shall not go into all the details of what can be done in the field of further education. The Dryer Report is a magnificent study of what can be and what must be done. In it we find laid out the whole range of possibilities, from the Socratic dialogue and the teaching lecture to closed-circuit television and the help to be given by electronic computers.

It is not given to all of us to do the same, whether for reasons that lie in the field of ideas or because of the difference of material facilities. Each country has its own philosophy of education, and we must not fall into the error of believing that tradition is invariably an empty formula or

necessarily a brake upon progress. We in Mexico are attracted rather more by simpler formulae, without any great technical complications, formulae in which the idea of personal contact is dominant. Education at a distance may be good, but only when the other solution, that of teacher-student contact, is out of the question. So long as physicians can be drawn to medical schools and to hospitals, so long as instead of offering them lessons over the radio one can take them to the bedside of a patient or to a laboratory bench, so long as teaching can be enlivened by the presence and personality of the teacher—so long as these things can be done, we shall always be inclined towards this kind of education. The other solution we shall reserve for the situation of Mahomet when he could not go to the mountain.

The Medical School of the National University of Mexico has only recently completed the reorganization of the structure of further education, an establishment on four levels. Beginning at the bottom level, it is concerned to help very large numbers toward a periodic renovation of knowledge, and it goes up to cover the training of specialists in limited numbers and of academic standing, and, at the highest levels, includes the degree of master and of doctor in order to satisfy the needs of teaching and research.

At each level, insofar as they deal with medical rather than purely scientific subjects, the major preoccupation of the school is to ensure the conservation of the Hippocratic spirit in our teaching; to ensure that the scientific medicine that we teach does not suffocate clinical medicine; that the spirit of research shall not supplant the spirit of observation, but rather complement it; that interest in medicine as such shall not override interest in the patient; that the wise physician shall never impede the formation of the cultivated physician. If it is the former, with his science, who ensures the efficacy of medicine, it is the latter, with his fine spirit, who ennobles and sometimes sanctifies the profession.

It is a task such as this, gentlemen members of Salerni Collegium, noble, important, and generous, that you are undertaking in benefit of the University of Southern California. I am confident that the fruits that will be gathered, in the form of yet more scientifically trained doctors, and of better health, improved welfare and greater happiness for your fellow citizens, will be in accord with the generosity of your efforts.

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